APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/476,615	12/31/1999	MICHAEL S. CRONE	GE-W-192-CIP	8072

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EXAMINER
BOYCE, ANDRE D

ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/476,615	CRONE, MICHAEL S.
	Examiner	Art Unit	
	Andre Boyce	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>01 September 2005</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>2-7 and 13-16</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) <u>2,6 and 13-15</u> is/are rejected.

7)☒ Claim(s) <u>3-5,7 and 16</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This Final Office action is in response to Applicant's amendment filed September

1, 2005. Claims 2-7 and 13-16 are pending.

2.   Applicant's arguments filed September 1, 2005 have been fully considered but

they are not persuasive.

Claim Rejections - 35 USC § 103

3.   The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

4.   Claims 2, 6, and 13-15 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Matheson et al (USPN 5,623,413), in view of Fabre et al (USPN

6,405,186).

As per claim 2, Matheson et al disclose in a multiple move, simulated annealing

method for resolving a scheduling problem associated with a plurality of orders for

train resources, each order having a cost function and a scheduling window

associated therewith (see column 19, lines 4-8), and (i) determining the total trip time

associated with the plurality of orders (determined by the movement planner, based

upon the trajectory of the train, see columns 13, lines 14-16 and 38-46); and (ii)

determining the total slack time associated with the plurality of orders (see column

26, lines 16-19, where the total time is calculated from slack percentage). Matheson

et al does not disclose the improvement comprising the steps of: (a) establishing

plural criteria for acceptance of a solution; (b) classifying the scheduling problem;

and (c) selecting the criteria for acceptance of a solution as a function of the

classification of the scheduling problem and (iii) determining the classification of the

problem as a function of the total trip time and the slack time. Fabre et al discloses

simulated annealing, where constructing an initial plan in order to improve the quality

of the simulated annealing is done by classifying the request (i.e., problem) with

certain criterion, and selecting the opportunities in the order determined by the

previously established classification (Applicant's step (c), see column 6, lines 10-20).

Fabre et al also discloses classifying requests in accordance with certain criterion

(see column 6, lines 11-14). Further, Matheson et al discloses rule-based criteria

that incorporate company policy, operating procedures, and experience factors,

among others (see column 24, lines 4-6), wherein train operating procedures include

total trip time and slack time, associated therein. Both Matheson and Fabre are

concerned with optimizing a cost function via the simulated annealing technique,

therefore it would have been obvious to one having ordinary skill in the art at the

time the invention was made to include (a) establishing plural criteria for acceptance

of a solution; (b) classifying the scheduling problem; and (c) selecting the criteria for

acceptance of a solution as a function of the classification of the scheduling problem,

and (iii) determining the classification of the problem in accordance with certain

criterion in Matheson, as seen in Fabre, as a way to improve the quality of the plan

obtained at the end of the process or to improve the speed of convergence on the

solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

Claim 6 is rejected based upon the rejection of claim 2, as seen above, as containing the same limitations therein. Further, Matheson et al disclose (a) determining the total trip time associated with the plurality of orders (determined by the movement planner, based upon the trajectory of the train, see columns 13, lines 14-16 and 38-46); and (b) determining the resource exception associated with the plurality of orders (see column 21, lines 10-12). Matheson et al do not explicitly discloses (c) determining the classification of the problem as a function of the total trip time and the resource exception. Fabre et al discloses classifying requests in accordance with certain criterion (see column 6, lines 11-14). Further, Matheson et al discloses rule-based criteria that incorporate company policy, operating procedures, and experience factors, among others (see column 24, lines 4-6), wherein train operating procedures include resource exception, total trip time and slack time, associated therein. Both Matheson and Fabre are concerned with optimizing a cost function via the simulated annealing technique, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include determining the classification of the problem in accordance with certain criterion in Matheson, as seen in Fabre, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

As per claims 13 and 15, Matheson et al disclose a method for resolving a scheduling problem associated with a plurality of orders for train resources by evaluating available moves in a simulated annealing process, each move resulting in a change in the resource exception associated with the problem and a change in cost associated with the move (see column 19, lines 4-8), comprising the steps of: (b) making a random move (see column 19, lines 14-15), (c) weighting the resource exception and cost factors associated with the random move (see column 21, lines 10-13); (d) evaluating the resource exception and the cost of the solution against a predetermined criteria (energy function); and g) accepting or rejecting the move based on the evaluation (see column 19, line 17-20). Matheson et al does not disclose (a) classifying the scheduling problem, a scaling parameter related to the classification of the problem, and the predetermined criteria is the classification of the problem. Fabre et al discloses classifying requests in accordance with certain criterion (see column 6, lines 11-14), and selecting the opportunities in the order determined by the classification (scaling parameter). Both Matheson and Fabre are concerned with optimizing a cost function via the simulated annealing technique, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include determining the classification of the problem in accordance with certain criterion in Matheson, as seen in Fabre, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

As per claim 14, Matheson et al does not disclose the steps of: (a) determining a normalizing component of the scaling parameter as a function of the change in resource exception and cost from previous moves; (b) determining a target resource exception as a function of the number of previous moves; and (c) determining a biasing component of the scaling parameter as a function of a comparison of the resource exception of the current move to the target resource exception. Fabre et al discloses developing threshold parameters in accordance with the simulated annealing technique (see column 5, lines 46-55) and the threshold percentage ensuring that the algorithm stabilizes after a certain number of moves (column 4, lines 63-64). Further, Matheson et al does disclose moves to satisfy the constraints and to obtain a lowest cost solution (see column 19, lines 4-8). As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include determining a normalizing component of the scaling parameter as a function of the change in resource exception and cost from previous moves; (b) determining a target resource exception as a function of the number of previous moves; and (c) determining a biasing component of the scaling parameter as a function of a comparison of the resource exception of the current move to the target resource exception in Matheson et al, as a way to improve the quality of the plan obtained at the end of the process or to improve the speed of convergence on the solution (see Fabre, column 6, lines 5-10), thus making the Matheson system more effective.

Response to Arguments

5.   With respect to claims 2 and 6, Applicant argues that neither Matheson nor Fabre

disclose a scheduling system classified according to the specific parameters as

recited in the claims. With respect to claim 2, Applicant argues that neither

Matheson et al nor Fabre et al disclose classification of the problem as a function of

total trip time and slack time. With respect to claim 6, Applicant argues that neither

Matheson et al nor Fabre et al disclose classification of the problem as a function of

total trip time and resource exception. The Examiner respectfully disagrees. With

respect to both claims 2 and 6, Fabre et al disclose classifying requests in

accordance with certain criterion (i.e., parameters) in order to construct an initial plan

determined by the classification, with respect to optimizing a cost function via a

simulated annealing technique (column 6, lines 11-23).

With respect to claim 2, Matheson et al discloses a slack time percentage

parameter, which provides the planner with cushion with respect to movement of the

train trips (column 26, lines 16-19). Further, Matheson et al disclose calculating the

total time associated with the execution of each trip (i.e., total trip time) using the

candidate resources (column 16, lines 1-4). As such, the combination of Matheson

et al and Fabre et al indeed disclose classification via slack time and total trip time.

With respect to claim 6, Matheson et al disclose calculating the total time

associated with the execution of each trip (i.e., total trip time) using the candidate

resources (column 16, lines 1-4). Further, Matheson et al disclose the resource

scheduler indicating that an exception has occurred and the identity of the resources

and activities involved in the exception (i.e., resources exception, column 20, lines 52-56). Further, Matheson et al disclose an energy function in terms of resource exception, operating costs, and goals (column 21, lines 10-13). As such, the combination of Matheson et al and Fabre et al indeed disclose classification via slack time and total trip time.

Applicant also asserts that the specific relationships between total trip time and total slack time, with respect to claim 2, and total trip time and resource exception, with respect to claim 6, are results-effective variables. First, the Examiner notes that Applicant incorrectly states that the Examiner has refused to acknowledge binding case law and refused to address Applicant's arguments with respect to results-effective variables. Instead, the Examiner was simply unclear as to the Applicant's specific argument. With respect to the argument, first it is noted that MPEP 2144.05 is concerned with obviousness of ranges, wherein result-effective variables can be optimized over a range. Here, Applicant is merely alleging that the specific relationships are results effective, not that the variables are results-effective over a particular range, as indicated in the MPEP. Further indication of a range requirement is that Applicant can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. Applicant has neither indicated that some particular range is results-effective nor submitted any showing of a critical range. As such, Applicant's assertion that the claimed relationships are results-effective is unpersuasive.

Applicant also argues that Fabre et al does not disclose a scaling parameter that includes both a normalizing and biasing (i.e., weighting) component. The Examiner submits that as seen in Applicant's specification on page 52, "[t]he scaling parameter may comprise two components, a normalizing component and a biasing component." As such, by use of the term "may", it is not necessary for the scaling parameter to include both components.

Allowable Subject Matter

6.   Claims 3-5, 7, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing

date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre Boyce whose telephone number is (571) 272-6726. The examiner can normally be reached on 9:30-6pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

adb
November 14, 2005

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